

NEW SPECIES AND NEW RECORDS OF RARE SPECIES OF
PYGOSTENINI FROM THE CONGO REPUBLIC¹

(Coleoptera: Staphylinidae)

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The purpose of this paper is chiefly to describe some new species of Pygostenini which were collected on a field trip to the Congo during the summer of 1960. In addition, some other species which have been previously described from rather small series were captured during the trip and these will be cited here where additional descriptive notes or ecological notes might be useful for future determinations.

Among the purposes of the trip were: (1) to collect fresh material of the Tribe Pygostenini (subfamily Aleocharinae) to augment and test revisions of the tribe based on museum specimens published earlier (Kistner 1958); (2) to study the nature of host specificity and the intra-nest distribution of the various species; (3) to study the behavior of the various species with particular emphasis on the use of the conspicuously adaptive structures; (4) to attempt to learn more about the habits of the Pygostenini associated with the more subterranean subgenera of driver ants (Dorylini). We have data that are relevant to all of these purposes which will be published as they are ready. The problem of understanding the nature of myrmecophilous behavior is much broader than merely understanding the behavior of the Pygostenini. In this regard it would have been almost impossible to collect data on the Pygostenini and to ignore totally the rest and majority of the myrmecophiles. These data on the other myrmecophiles will also be reported as fast as accurate determinations are available.

The localities which are included in the paper are Eala, Equateur province and Yangambi, Oriental province. Eala is located about eight kilometers by road from Coquilhatville along the north bank of the Ruki river. It was the site of a *Jardin d'Essais* of the *Institut National pour l'Étude agronomique du Congo Belge* (I.N.E.A.C.). This was our first stop in the Congo and was chiefly important to us in that we found out which collecting and observation methods would not work. Yangambi is 101 kilometers by the shortest road from Stanleyville and is downstream along the north bank of the Congo River. It was the site of the *Centre de*

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Recherche of I.N.E.A.C. It was at Yangambi that we learned productive methods for sampling myrmecophiles and hence most of the new species reported here are from this locality.

Collecting myrmecophiles from driver ant nests is a rather specialized activity and since there are no methodological notes in the literature (so far as I know), a brief comment on what was and what was not productive might be useful. Our first thought about sampling myrmecophiles was to work with the nest itself. We made three attempts at this, all of which were unsuccessful. The first time we tried brute force by simply digging into a living nest. The nests have an enormous number of ants in them (15-22 million per nest for *Dorylus (Anomma) wilverthi* Emery according to Raignier and Van Boven's 1955 paper) and the physical discomfort resulting from even a small number of these ants swarming over one precludes any sustained scientific study. We then tried killing the nest using 10% powdered DDT and this was too slow. The nest was 4 days dying and by the time we could look for myrmecophiles we had a decaying tangle of ants which yielded no significant data. We then tried methyl bromide which killed the nest in about 20 hours but still the problem of sorting the myrmecophiles out from about a cubic yard of tangled dead ants was beyond budgetary consideration.

We then switched to working the columns. In raiding or in changing their nests from one location to another, the ants proceed in a rather orderly column or columns. The nest-changing columns are fortunate for the sampler in that everything in the nest is moved. Thus by watching the nest-changing columns, one can aspirate the myrmecophiles. After a little practice at this, one can aspirate the myrmecophiles with a minimal disturbing effect on the column. It also developed that most if not all of the myrmecophiles were also to be found in the raiding columns.

Throughout the field work, the collectors worked as a team. The collectors were an assistant, Mr. Robert Banfill, now at Montana State College, Bozeman; my wife; and myself. Once a column was located each collector took a position along the column and collected all the myrmecophiles he saw. Thus all the specimens in this paper were collected by and bear the label, "Coll. D. H. & A. C. Kistner and R. Banfill," unless otherwise cited. I shall have more to say about the sampling method in future papers but one measure of the success of the method is that in about three weeks at Yan-

gambi we collected a little more than 13,000 myrmecophiles of which 3192 were Pygostenini.

The author is grateful to his wife and Mr. Banfill not only for the long hours of collecting in an uncomfortable situation but also for the equally long hours spent preparing the material for study. Thanks are given to Professor J. K. A. van Boven, Institut de Zoologie, Université de Louvain for the determinations of the ant hosts.

For help in the field and the use of facilities during this phase of our trip, we are greatly indebted to the following men, all of whom were formerly associated with I.N.E.A.C.: M. F. Jurion, Directeur general; M. J. Brynaert, Directeur general en Afrique; M. E. Bernard, Directeur du Centre de Recherche de Yangambi; M. E. Buyckx, Maitre de Recherche; M. J. Thiry, Conservateur de Jardin d'Essais d'Eala; M. J. Decelle and M. J. Dubois, Division de Phytopathologie et d'Entomologie agricole.

All specimens herein cited are retained in the collection of the author to be eventually deposited in the Chicago Natural History Museum unless stated otherwise.

Genus TYPHLOPONEMYS Rey

LUJAE GROUP

TYPHLOPONEMYS AFER Kistner

(Fig. 1)

Typhloponemys afer Kistner, 1958a, Explor. Parc Nat. Upemba, Miss. G. F. de Witte *et al.*, 1946-1949, fasc. 49(4):37, figs. 5-9-Institut des Parcs Nationaux du Congo et du Ruanda-Urundi, Brussels, (Congo Republic: Parc National de l'Upemba, Lusinga, no host.)

This species was originally described from the unique holotype female. Since then we captured a male and a female both of which compared exactly with the data on the original specimen. Since the above specimen was the first male captured, the median lobe of its genitalia is here figured.

Material examined: 1 male, 1 female, Congo Republic, Yangambi, 29 June 1960, from the central part of a raiding column of *Dorylus (Anomma) wilverthi* Emery, nest No. 18.

BICOLOR group

Typhloponemys decellei Kistner, new species

(Figs. 2, 3)

Distinguished from all other species, including *T. bicolor* Wasmann to which it is most closely related, by the shape of the spermatheca and the shape of the median lobe of the male genitalia.

Color reddish brown. Pronotum and abdomen a little lighter than the rest of the body but sometimes evenly colored. Dorsal surface of the head, pronotum, and elytra smooth and shiny, very finely and evenly punctate. Larger punctures, containing very short, fine yellow setae scattered irregularly among the finer punctures. Macrochaetotaxy of abdominal tergites II-VIII:0,0,0,0,4,4,0. Macrochaetotaxy of abdominal segment IX as follows: dorsolateral plates, 7, most anterior chaeta smaller, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 5 of which 3 are dark and 2 are light in color; ventro-lateral part, 4 of which 1 is dark and 3 are light in color; median lobe, 7. Spermatheca shaped as in fig. 2. Median lobe of the male genitalia shaped as in fig. 3.

Measurements: Pronotum length, 0.40-0.57 mm; elytra length, 0.38-0.54 mm; interocular distance, 0.35-0.47 mm; head length, 0.24-0.35 mm. Number measured, 21.

Holotype female, No. 5311, CONGO REPUBLIC, YANGAMBI, from a nest-changing column, Coll. J. Decelle.

Paratypes (151 specimens): Congo Republic, Yangambi: 26 (3 males, 3 females), same data as holotype; 4, 23 June 1960, from a raiding column of *Dorylus (Anomma) wilverthi* Emery, nest No. 2; 7 (1 male), 24 June 1960, from raiding columns of *D. wilverthi*, nest No. 3; 5 (1 female), 25 June 1960, from the central parts of raiding columns of *D. wilverthi*, nest No. 7; 4, 26 June 1960, from central part of a raiding column, after dark, of *D. wilverthi* nest No. 11; (1 male, 1 female), 27 June 1960, from central part of a raiding column of *D. wilverthi*, nest No. 12; 2, 27 June 1960, from central part of a raiding column of *D. wilverthi*, nest No. 13; 8, 28 June 1960, from central part of raiding columns of *D. wilverthi*, nest No. 16; 1 male, 28 June 1960, from the end of a raiding column of *D. wilverthi*, nest No. 16; 37 (5 males, 4 females), 29 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 18; 9 (2 males), 1 July 1960, from the central parts of nest changing columns of *D. wilverthi*, nest No. 19; 1, 1 July 1960, from the end of a raiding column of *D. (A.) nigricans* ssp. *burmeisteri* var. *terrificus* Santschi, nest No. 20; 2, 1 July 1960, from the end of a raiding column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 21; 1, 1 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 22; 6 (1 male), 2 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 23; 3 (1 female), 3 July 1960, from the central parts of raiding columns of *D. wilverthi*, nest No. 24; 8 (3 males, 1 female), 3 July 1960 from the end of a raiding column of *D. wilverthi*, nest No. 24; 1 male, 3 July 1960, from a raiding column of *D. wilverthi*, nest No. 26, Coll. J. Decelle; 1, 5 July 1960, from the end of a raiding column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 27; 1, 5 July 1960, from the underground nest-changing column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 29; 16 (2 males, 3 females), 7 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 31; 4 (2 males, 1 female), 9 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 35; 1 male, 1 female, September 1952, with *Dorylus* sp. Coll. J. Decelle, (Formerly classified as

T. bicolor Wasmann by Kistner 1958), (Collection of Musée Royal de l'Afrique Centrale, Tervuren and the author).

This species is named after my friend and colleague, M. J. Decelle formerly with I.N.E.A.C. at Yangambi, who helped us ever so much in the field and provided us with needed supplies, equipment, and space while we were at Yangambi.

FAUVELI group

***Typhloponemys buyckxi* Kistner, new species**

(Figs. 4-7)

Distinguished from all other species including *T. fauveli* Wasmann to which it is most closely related and which is found in the same locality by the shapes of the spermatheca and the median lobe of the male genitalia.

Color variable from light yellowish brown to orange, but always uniformly colored. Dorsal surface of the head, pronotum, and elytra smooth and shiny, covered with numerous fine yellow setae, which is denser toward the lateral margins. Macrochaetotaxy of abdominal segments II-VIII: 0,4,4,4,4,4,0. Macrochaetotaxy of abdominal segment IX as follows: dorso-lateral plates: 6, most anterior chaeta smaller, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 5 (3 black, 2 lighter); ventro-lateral part 4 (2 black, 2 lighter); median lobe 7. Spermatheca somewhat variable, shaped as in figs. 4, 5, and 6 with all intermediates seen. Those shaped as in fig. 4 are from larger specimens, those shaped as in fig. 5 from smaller specimens, and those shaped as in fig. 6 from the smallest specimens. Size of specimens is continuously variable as has been shown for many species of Pygostenini and where the spermatheca has coiling and twisting, this has also been shown to be continuously variable in other species. Median lobe of the male genitalia shaped as in fig. 7.

Measurements: Pronotum length, 0.50-0.70 mm; elytra length, 0.47-0.70 mm; interocular distance, 0.40-0.52 mm, head length, 0.28-0.37 mm. Number measured, 19.

Holotype female, No. 7195, CONGO REPUBLIC, YANGAMBI, 28 June 1960, from the central part of a raiding column of *Dorylus (Anomma) wilverthi* Emery, nest No. 16.

Paratypes (36 specimens): Congo Republic: Yangambi: 2 females, same data as the holotype; 2 males, 21 June 1960, from the run-away area of *D. wilverthi*, nest No. 1; 1 female, 25 June 1960, from the end of a raiding column of *D. (A.) emeryi* ssp. *opacus* Forel, nest No. 5; 1 male, 25 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 6; 1 male, 27 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 12; 1 female, 27 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 13; 1 male, 28 June 1960, from the end of a raiding column of *D. wilverthi*, nest No. 16; 6 males, 29 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 18; 1 female, from the central part of a nest-changing column of *D. wilverthi*,

nest No. 19; 7 males, 1 July 1960, from the end of a raiding column of *D. (A.) nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 21; 5 males, 5 July 1960, from the end of a raiding column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 27; 2 females, 8 July 1960, from the central part of a raiding column of *D. (A.) kohli* var. *congolensis* Santschi, nest No. 32; 2 males, 9 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 35; 4 males, 9 July 1960, from the end of a raiding column of *D. wilverthi*, nest No. 35.

Though *T. fauveli* Wasmann was taken in the same locality it was not taken from the same nests, but the numbers taken were too small to be truly significant. The only way the two species can be told apart is by dissecting out the genitalia. Data on *T. fauveli* Wasmann from Yangambi: 2 males, 1 female, 3 July 1960, from the end of a raiding column of *D. wilverthi*, nest No. 24; 1 female, 7 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 31.

This species is named for M. E. Buyckx who was extremely helpful to us during our stay at Yangambi.

***Typhloponemys bernardi* Kistner, new species**

(Figs. 8 & 9)

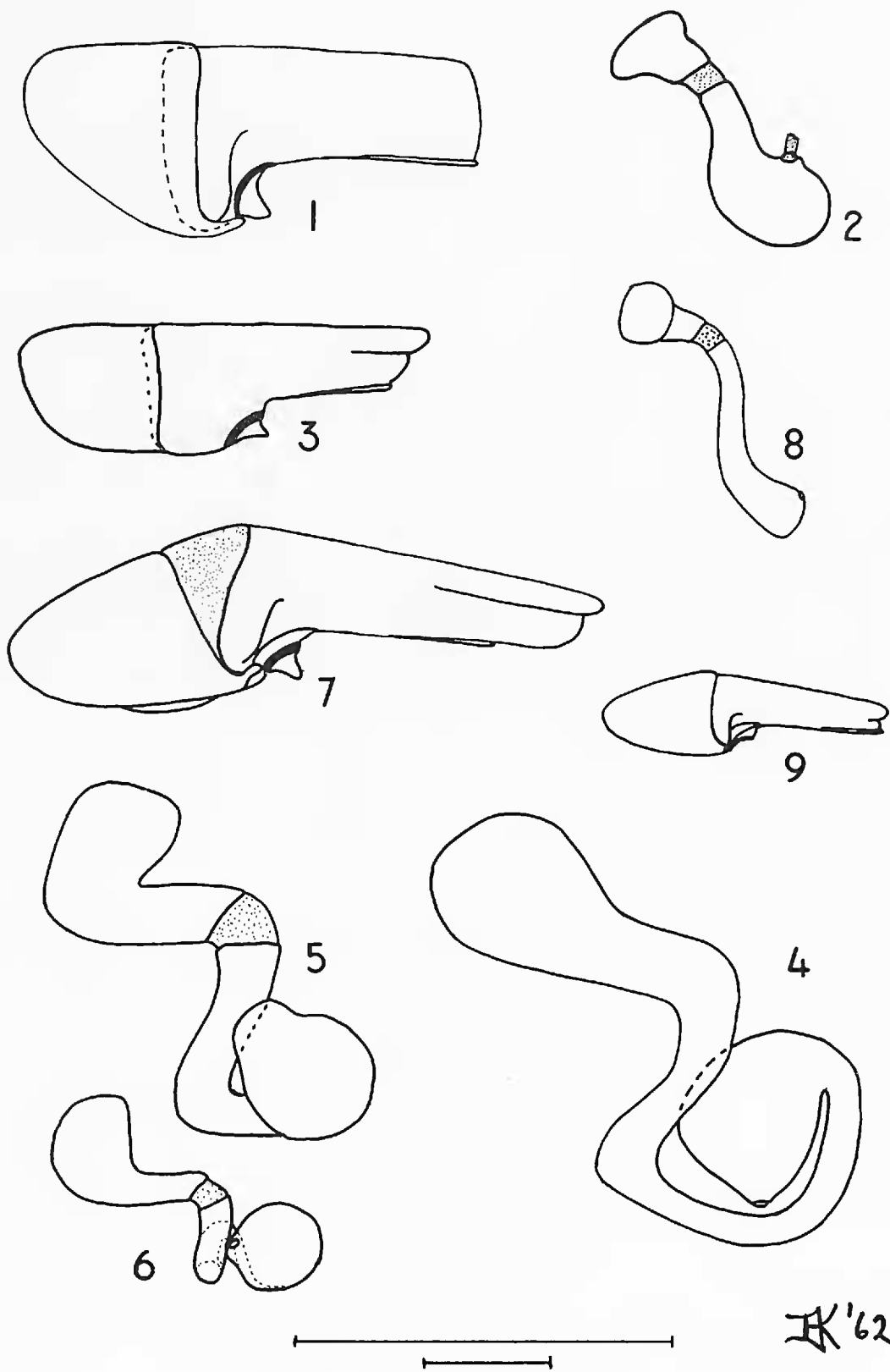
Distinguished from all other species, including *T. rufotestaceus* Bernhauer, to which it is most closely related, by the shape of the spermatheca and the median lobe of the male genitalia.

Color yellowish brown throughout. Head, pronotum, and elytra smooth and shiny; sparsely covered with fine yellow setae. Macrochaetotaxy of abdominal tergites II-VIII: 0,2,2,2,4,4,0. Macrochaetotaxy of abdominal segment IX as follows: dorsal-lateral plates, 6, most anterior chaeta smaller, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 5 (2 black, 3 light); ventro-lateral part, 4 (2 black, 1 light). Spermatheca shaped as in fig. 8. Median lobe of male genitalia shaped as in fig. 9.

Measurements: Pronotum length, 0.27-0.35 mm; elytra length, 0.24-0.36 mm; interocular distance, 0.25-0.30 mm; head length, 0.15-0.21 mm. Number measured, 20.

Holotype female, No. 7160, CONGO REPUBLIC, YANGAMBI, 29 June 1960, from the central part of a raiding column of *Dorylus (Anomma) wilverthi* Emery, nest No. 18.

Paratypes (20 specimens): Congo Republic, Yangambi: 1 male, 2 females, same data as holotype; 1 female, 23 June 1960, from a raiding column of *D. wilverthi*, nest No. 2; 2 males, 2 females, 24 June 1960, from a raiding column of *D. wilverthi*, nest No. 3; 3 males, 25 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 6; 2 (1 male), 27 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 6; 2 (1 male), 27 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 12; 1 male, 2 July 1960, from the end of a nest-



EXPLANATION OF FIGURES

Figs. 1-9: Median lobes of male genitalia: 1—*Typhloponemys afer* Kistner; 3—*T. decellei* n.sp.; 7—*T. buyckxi* n.sp.; 9—*T. bernardi* n.sp. Spermathecae: 2—*T. decellei* n.sp.; 4,5,6, Variations of *T. buyckxi* n.sp.; 8—*T. bernardi* n.sp. Large scale applies to figures of the spermathecae. Small scale applies to figures of the genitalia. Each represents 0.25 mm.

changing column of *D. wilverthi*, nest No. 19; 1 male, 5 July 1960, from the end of a raiding column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 27; 1 male, 5 July 1960, from the central part of a raiding column of *D. nigricans* ssp. *burmeisteri* var. *ornatus* Santschi, nest No. 28; 1 male, 7 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 31; 2 males, 9 July 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 35; 1 male, 9 July 1960, from the end of a raiding column of *D. wilverthi*, nest No. 35.

This species is named for M. E. Bernard, former director of research at Yangambi, who was extremely helpful to us during our stay there. It is also named for his wife, a most courageous lady, who was one of the three European ladies to attend the Independence ceremonies at Yangambi.

WITTEI group

TYPHLOPONEMYS WITTEI Cameron

Pygostenus wittei Cameron, 1950, Explor. Parc Nat. Albert, Miss. G. F. de Witte, 1933-1935, fasc. 59:44 (Institut des Parcs Nationaux du Congo et Ruanda-Urundi, Brussels, (Congo Republic: Rutshuru, no host).

Typhloponemys wittei, Kistner, 1958, Ann. Mus. Roy. Congo Belge, Tervuren, Ser in 8^{to}, Zool., 58:80; Kistner, 1958b, Explor. Parc Nat. Albert, Miss. G. F. de Witte, 1933-1935, fasc. 91 (1):4, figs. 2, 3, 4, and 9.

This species has not been taken previously with any ant host. Although only one specimen was captured at Yangambi, it was taken in a definitive way with an identifiable host so it is cited here.

Material examined: 1 male, Congo Republic, Yangambi, 8 July 1960, from the central part of a raiding column of *Dorylus (Anomma) kohli* var. *congolensis* Santschi, nest No. 32.

PUMILIO group

When this species group was first erected (Kistner 1958, p. 80), there were very few (33) specimens of three species available. Probably because of the paucity of material, the distribution of the species showed a geographic discontinuity which in fact does not exist. All of the Congo species will be revised here and a few new ones added.

The host situation of this group is not clear. Although material was taken in and around ant columns, the captures were not definitive. The species are all small and seem to fly or be blown through the air quite readily. Most of our captures were effected by the use of an aerial plankton net. Members of this species group are taken so readily with an aerial plankton net in comparison to species quite common in the ant columns which are only occasionally caught flying, that one wonders if they have any regular hosts

at all. The capture of them hovering over broken termite nests could indicate that they are attracted to any massive array of dead insects and thus would be found near driver ant columns of any species. The members of the species group nevertheless have all the structural modifications of the rest of the genus.

KEY TO CONGO SPECIES

1. Macrochaetotaxy of abdominal tergites II-VIII: 0,0,0,0,2,0.....
basilewskyi Kistner
 Macrochaetotaxy of abdominal tergites II-VIII not as above..... 2
2. Macrochaetotaxy of abdominal tergites II-VIII, 2,4,4,4,4,0..... 3
 Macrochaetotaxy of abdominal tergites II-VIII, 2,2,2,4,4,4,0 or
 2,2,4,4,4,4,0 4
3. Macrochaetotaxy of abdominal tergites with the middle two reduced
 on tergites III and IV, spermatheca shaped as in fig. 11.....*banfilli* Kistner
 Macrochaetotaxy of abdominal tergites with all chaetae reduced on
 tergites II, III & IV; spermatheca shaped as in fig. 13.....*gemina* Kistner
4. Macrochaetotaxy of abdominal tergites II-VIII, 2,2,2,2,4,4,0; sperma-
 theca shaped as in fig. 15I (Kistner 1958).....*pumilio* Bernhauer
 Macrochaetotaxy of abdominal tergites II-VIII, 2,2,2,2,4,4,0; sperma-
 theca shaped as in fig. 15J (Kistner 1958).....*morio* Kistner

TYPHLOPONEMYS PUMILIO Bernhauer

Pygostenus pumilio Bernhauer 1932, Rev. Zool. Bot. Afr., 22:159—Musée Royal de l'Afrique Centrale, Tervuren, (Congo Republic: Prov. Orientale, Haut Uele, Moto).

Typhlopone mys pumilio, Kistner, 1958, Ann. Mus. Roy. Congo Belge, Tervuren, Sér. in 8^{to}, Zool. 68:81 (figs. 15I; 16B)—(Congo Republic: Prov. Orientale, Haut Uele, Abimva).

An additional 12 specimens have been examined (there were only three originally) and no major deviations from the description given by Kistner (1958) have been noted.

Material examined: Congo Republic, Yangambi: 1 male, 25 June 1960, netted from vegetation surrounding raiding column of *Dorylus (Anomma) wilverthi*, nest No. 9, Coll. J. Decelle; 1 female, 1 July 1960, netted over a nest-changing column of *D. wilverthi*, nest No. 19; 1 female, 5 July 1960, aerial plankton net from car (P.M.); 1 male, 5 July 1960, aerial plankton net from car (A.M.); 2 males, 1 female, 6 July 1960, aerial plankton net over broken *Cubitermes* nest (No. 311) about 30 minutes after nest was broken; 1 male, 3 females, 6 July 1960, aerial plankton net from car; 1 female, 9 July 1960, aerial plankton net from car.

TYPHLOPONEMYS MORIO Kistner

Typhlopone mys morio Kistner, 1958, Ann. Mus. Royal Congo Belge Tervuren, Sér. in 8^{to}, Zool. 68:81, (figs. 7M; 15J; 16C)—Musée Royal de l'Afrique Centrale, Tervuren, (Congo Republic, Kunungu and Kwamouth, no hosts).

An additional seven specimens have been examined (there

were only two originally) and no major deviations from the description given by Kistner (1958) were noted. However, most of the specimens were somewhat smaller. The usual variation for *Typhloponemys* is in the neighborhood of 80% when large series are available and measured, so the appearance of smaller or larger specimens of rare species is to be expected.

Material examined: Congo Republic: Yangambi: 1 female, 2 July 1960, from the end of a nest-changing column of *Dorylus (Anomma) wilverthi*, nest No. 19; 2 males, 3 females, 6 July 1960, aerial plankton net over a broken *Cubitermes* nest (No. 311) about 30 minutes after nest was broken; 1 female, 6 July 1960, aerial plankton net from car (A.M.)

TYPHLOPONEMYS BASILEWSKYI Kistner

(Fig. 10)

Typhloponemys basilewskyi Kistner, 1958, Ann. Mus. Royal Congo Belge, Tervuren, Sér. in 8^{to}, Zool., 68:82 (figs. 4C; 6G; 15K; 16D)—Musée Royal de l'Afrique Centrale, Tervuren, (Congo Republic: Sankuru, Komi, no definite host).

Five more specimens were examined. It was noted that there is considerable variation in the shape of the spermatheca. They vary from a relatively straight shape (fig. 10) to the fish-hook shape figure by Kistner (1958, p. 71, fig. 15K). The most constant part is the shape of the bulbous head. The male genitalia seem to be constant.

Material examined: Congo Republic: Yangambi: 1 female, 25 June 1960, netted from vegetation surrounding nest of *Dorylus (Anomma) wilverthi*, nest No. 9, Coll. J. Decelle; 1 male, 29 June 1960, on insectory screen, Coll. J. Decelle; 1 female, 4 July 1960, aerial plankton net over broken *Cubitermes* nest (No. 311) about 30 minutes after nest was broken; 1 male, 11 July 1960, aerial plankton net from car.

Typhloponemys banfilli Kistner, new species

(Figs. 11 and 12)

Distinguished from all other species by the shape of the spermatheca and the median lobe of the male genitalia. Most closely related to *T. pumilio* Bernhauer, from which it is distinguished by both of the above characteristics.

Color dark reddish brown throughout; head and pronotum somewhat darker than the rest of the body. Dorsal surface of the head, pronotum, and elytra smooth and shiny; finely and evenly punctate. Macrochaetotaxy of abdominal tergites II-VIII: 2,4,4,4,4,0, with the middle two on tergites III and IV greatly reduced in size. Macrochaetotaxy of abdominal segment IX as follows: dorso-lateral part, 6, most anterior chaeta smaller, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 5 (3 dark, 2 light); ventro-lateral part, 4 (2 dark, 2 light); median lobe, 7. Spermatheca shaped as in fig. 11. Median lobe of the male genitalia carinate, shaped as in fig. 12.

Measurements: Pronotum length, 0.39-0.51 mm; elytra length, 0.30-0.43 mm; head length, 0.20-0.26 mm; interocular distance, 0.39-0.46 mm. Number measured, 7.

Holotype female, No. 7222, CONGO REPUBLIC, YANGAMBI, 6 July 1960, aerial plankton net from car.

Paratypes (6 specimens): Congo Republic, Yangambi: 2 females, same data as holotype; 1 male, 5 July 1960, aerial plankton net from car (A.M.); 1 female, 6 July 1960, aerial plankton net over broken *Cubitermes* nest (No. 311) about 30 minutes after the nest was broken; 1 female, 6 July 1960, aerial plankton net over broken *Cubitermes* nest (No. 311), about 2 hours after the nest was broken; 1 male, 8 July 1960, aerial plankton net from car.

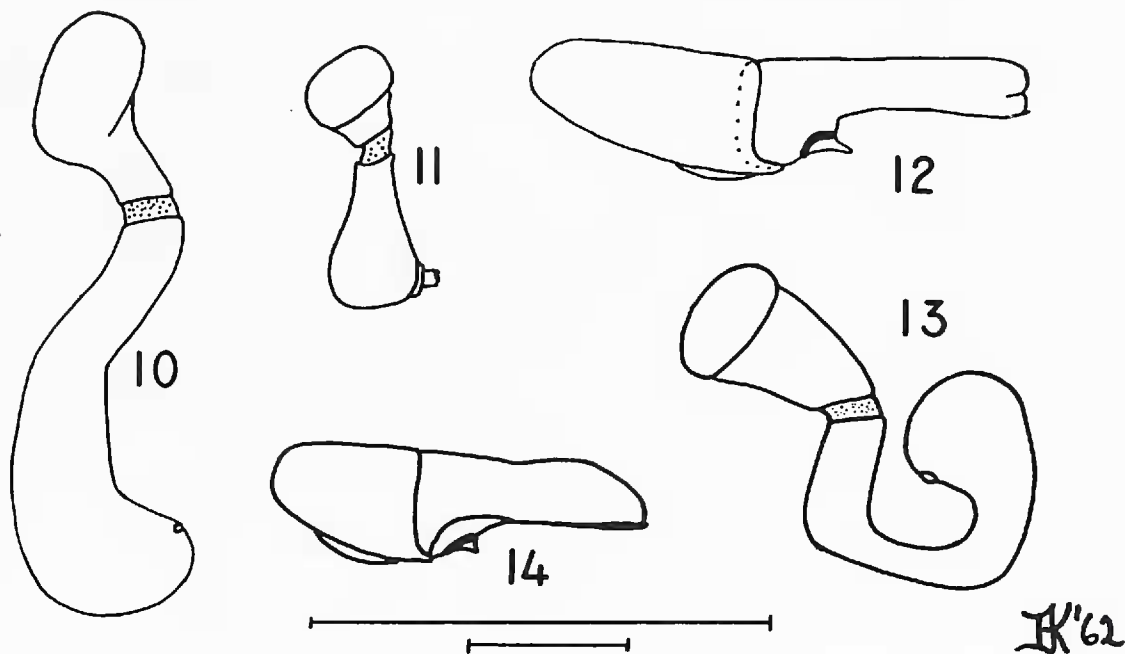
This species is named for our energetic assistant, Mr. Robert Banfill, now at Montana State College, Bozeman.

***Typhloponemys gemina* Kistner, new species**

(Figs. 13 and 14)

Distinguished from all other species by the shape of the spermatheca and the median lobe of the male genitalia. Most closely related to *T. pumilio* Bernhauer from which it is distinguished by both of the above features.

Color dark reddish brown throughout. Head and pronotum a little darker than the rest of the body. Dorsal surface of the head, pronotum, and elytra smooth and shiny, finely and evenly punctate. Macrochaetotaxy of abdominal tergites II-VIII: 2,4,4,4,4,0; all of the macrochaetae on tergites II-IV are barely visible. Macrochaetotaxy of abdominal segment IX as fol-



EXPLANATION OF FIGURES

Figs. 10-14: Median lobes of male genitalia: 12—*Typhloponemys banfilli* n.sp.; 14—*T. gemina* n.sp. Spermathecae: 10—*T. pumilio* Bernhauer; 11—*T. banfilli* n.sp.; 13—*T. gemina* n.sp. Large scale applies to figures of the spermathecae. Small scale applies to figures of the genitalia. Each represents 0.25 mm.

lows: dorso-lateral part 6, most anterior chaeta shorter, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 5, (3 dark, 2 light), ventro-lateral part, 4, (2 dark, 2 light); median lobe, 7. Spermatheca shaped as in fig. 13. Median lobe of male genitalia shaped as in fig. 14.

Measurements: Pronotum length, 0.43-0.59 mm; elytra length, 0.28-0.42 mm; head length, 0.22-0.29 mm; interocular distance, 0.33-0.44 mm. Number measured: 6.

Holotype female, No. 7223, CONGO REPUBLIC, YANGAMBI, 6 July 1960, aerial plankton net from car.

Paratypes (5 specimens): Congo Republic, Yangambi: 2 males, 25 June 1960, netted from vegetation surrounding nest of *Dorylus (Anomma) wilverthi* nest No. 9, Coll. J. Decelle; 1 male, 4 July 1960, aerial plankton net from car; 1 female, 5 July 1960, aerial plankton net from car (A.M.); 1 female, 9 July 1960, aerial plankton net from car.

Genus DORYLOXENUS Wasmann

Doryloxenus alzadae Kistner, new species

(Fig. 15)

Distinguished from all other species by the shape of the spermatheca. Most closely related to *Doryloxenus wasmanni* Cameron from which it can be distinguished by its somewhat smaller size and heavier shagreening as well as the character above.

Color dark reddish brown throughout. Dorsal surface of the head, pronotum, and elytra finely shagreened with short yellow setae scattered evenly but sparsely about. Macrochaetotaxy of abdominal tergites II-VIII: 2,4,4,4,4,0. Spermatheca shaped as in fig. 15.

Measurements: Pronotum length 0.55-0.57 mm; elytra length, 0.35-0.37 mm; head length, 0.28-0.30 mm; head width, 0.41-0.47 mm. Number measured, 3.

Holotype female, No. 4460, CONGO REPUBLIC, YANGAMBI, 24 June 1960, from a raiding column of *Dorylus (Anomma) wilverthi* Emery, nest No. 3.

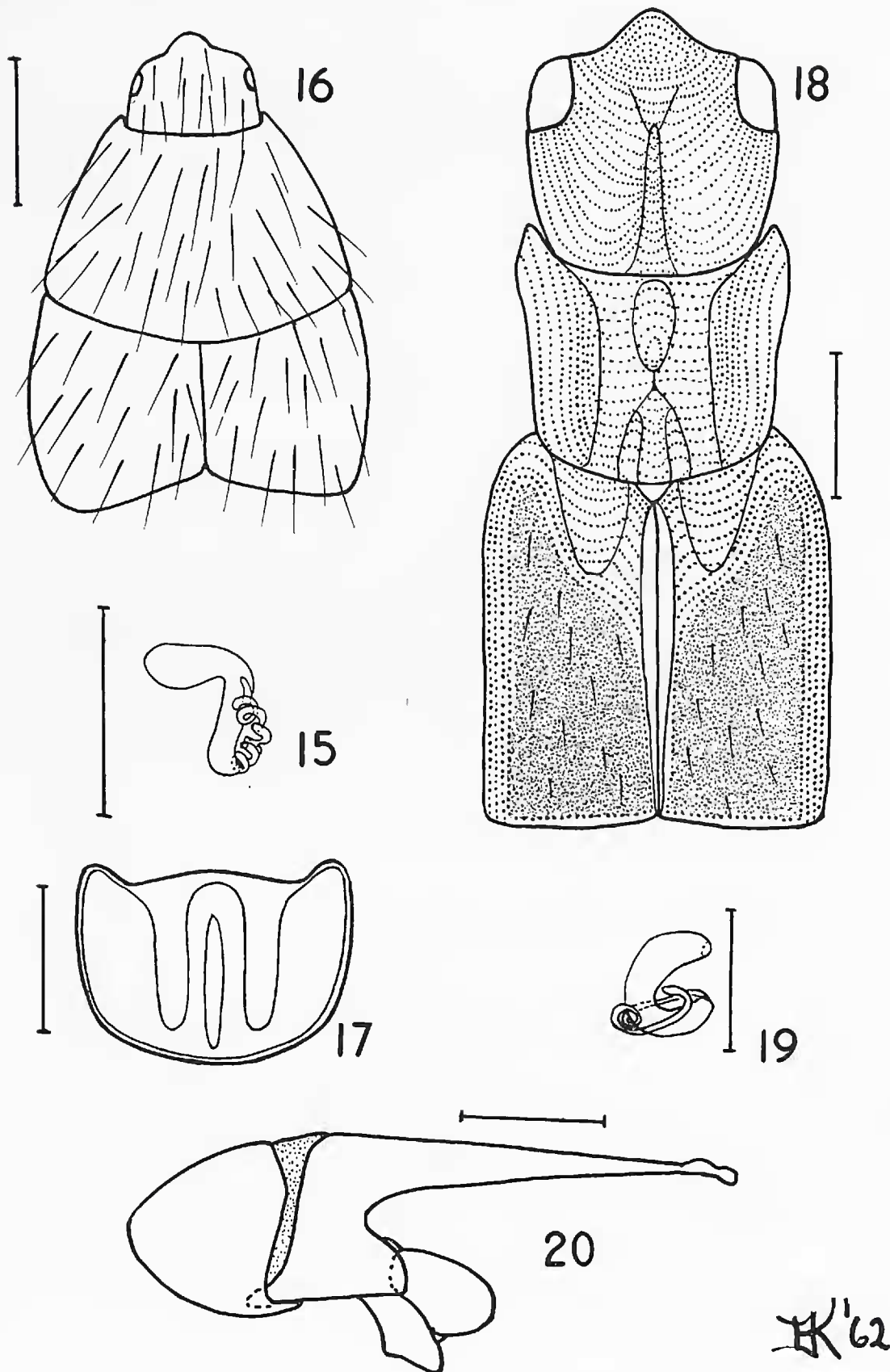
Paratypes (2 specimens): Congo Republic, Yangambi; 1 male, 27 June 1960, from the central part of a nest-changing column of *D. wilverthi*, nest No. 14; 1 female, 27 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 12.

Doryloxenus superhirsutus Kistner, new species

(Fig. 16)

Distinguished from all other species by the presence of extremely long yellow setae distributed over the surface of the head, pronotum, and elytra. Most closely related to *D. eques* Wasmann from which it is distinguished by the characteristic above.

Color dark reddish brown throughout. Dorsal surface of the head, pronotum and elytra shiny and slightly shagreened with long golden setae scattered evenly over their surfaces as in fig. 16. Macrochaetotaxy of abdominal



EXPLANATION OF FIGURES

Figs. 15-20: Spermathecae: 15—*Doryloxenus alzadae* n.sp.; 19—*Symplemon uhurui* n.sp. 16: Head, pronotum and elytra of *D. superhirsutus* n.sp. showing relative length and density of the long setae; 17: Pronotum, *Micropoleum mzuri* n.sp.; 18: Head, pronotum, and elytra of *S. uhurui* n.sp.; 20: Median lobe of male genitalia, *S. uhurui* n.sp. Each scale represents 0.25 mm.

tergites II-VIII: 0,0,0,0,0,0. Female unknown and male genitalia are not diagnostic in this genus.

Measurements: Pronotum length 0.32-0.37 mm; elytra length, 0.20-0.25 mm; head length, 0.17-0.20 mm; head width, 0.21-0.25 mm. Number measured, 2.

Holotype male, No. 4803, CONGO REPUBLIC, YANGAMBI, 7 July 1960, aerial plankton net from car.

Paratype: 1 male, Congo Republic, Yangambi, 9 July 1960, aerial plankton net from car.

Genus MICROPOLEMON Wasmann

Micropolemon mzuri Kistner, new species

(Fig. 17)

Distinguished from all other species including *M. tiro* Wasmann, to which it is most closely related, by the sculpture of the pronotum.

Color reddish brown throughout. Dorsal surface of the head, pronotum, and elytra deeply punctate with fine yellow setae scattered in regular sequence. Pronotum with three longitudinal grooves; neither the lateral ones reaching the posterior border nor the median one (fig. 17). Macrachaetotaxy of abdominal segment IX as follows: dorso-lateral plates, 4; median dorso-lateral part, 4; ventro-lateral part, 2; median lobe, 4 of which 2 are apical.

Measurements: Pronotum length, 0.26-0.31 mm; elytra length, 0.28-0.34 mm; head length, 0.28-0.30 mm; interocular distance, 0.27 mm. Number measured, 2.

Holotype male, No. 4436, CONGO REPUBLIC, EALA, 16 June 1960, ex yellow trays near a nest of *Dorylus (Anomma) wilverthi* Emery.

Paratype: 1 male, Congo Republic, Yangambi, 6 July 1960, aerial plankton net from car.

Genus SYMPOLEMON Wasmann

Sympolemon uhurui Kistner, new species

(Fig. 18, 19, 20)

Distinguished from all other species by the sculpture of the head and pronotum, the shape of the male genitalia, and the spermatheca. It can be easily discriminated from the other two species by means of the following key.

1. Elytra without grooves on the basal third.....*S. rufobrunneus* Tottenham
Elytra with grooves on the basal third..... 2
2. Median elevation of pronotum continuous, pronotum length 0.62-0.68 mm, dorsal surface of head smoothly rounded.....*S. anommatidis* Wasmann
Median elevation of pronotum broken into a small anterior hillock and a grooved posterior elevation, pronotum length 0.40-0.45 mm, head with a deep cleft in the dorsal surface.....*S. uhurui* Kistner

Color reddish brown throughout. Dorsal surface of the head and pronotum punctate with the punctures in rows following the sculpture. Head, pronotum, and elytra shaped as in fig. 15 with the following noteworthy sculpture: Head with a deep cleft on the median dorsal surface. Pronotum with an anterior median hillock and a posterior grooved hillock. Elytra with scalloped anterior grooves. Dorsal surface of the elytra with contoured punctures along the sides and front but with finer, more randomly placed punctures in the center portion (fig. 18). Macrochaetotaxy of abdominal tergites II-VIII: 0,0,0,0,4,4,0. Macrochaetotaxy of abdominal segment IX as follows: dorsal-lateral plates, 5 most anterior chaeta smaller, thinner, and lighter in color than the more posterior ones; median dorso-lateral part, 4; ventro-lateral part, 4; median lobe, 4, with two at the apex. Spermatheca shaped as in fig. 19, the small thinly chitonized coiled part variable. Median lobe of the male genitalia shaped as in fig. 20. Males with a vestiture of extra-long golden setae on the inner side of antennal segments III-V. Females without this characteristic.

Measurements Pronotum length, 0.40-0.45 mm; elytra length, 0.49-0.52 mm; eye length, 0.18-0.22 mm; interocular distance, 0.35-0.37 mm; head length, 0.42-0.49 mm. Number measured, 8.

Holotype male, No. 4370, CONGO REPUBLIC, YANGAMBI, 1 July 1960, from the central part of a nest-changing column of *Dorylus (Anomma) wilverthi* Emery, nest No. 19.

Paratypes (Seven specimens): Congo Republic: Yangambi: 4 males, 2 females, same data as holotype; 1 female, 25 June 1960, from the central part of a raiding column of *D. wilverthi*, nest No. 6.

The principal series of this species was taken on the first full day of Congolese independence. For this reason the species is named after the Kiswahili word for freedom, *uhuru*. This is the second species of Pygostenini where a clearcut secondary sexual characteristic is present. I checked through all the rest of species of *Sympolemon* that I have and none have the extra tufts of setae on segments III-V of the antennae of males. The other species is *Anommatoxenus clypeatus* Wasmann, in which females tend to be much larger (50%) than males.

LITERATURE CITED

BERNHAEUER, MAX

1932. Neue Kurzflügler aus dem belgischen Kongostaate. (29. Beitrag zur Afrikanischen Fauna). Rev. Zool. Bot. Afr. 32:140-174.

CAMERON, MALCOLM

1950. Staphylinidae (Coleoptera Polyphaga). Explor. Parc Nat. Albert, Miss. G. F. de Witte, 1933-1935, Fasc. 59.

KISTNER, DAVID H.

1958. The evolution of the Pygostenini (Coleoptera Staphylinidae). Ann. Mus. Royal Congo Belge Tervuren, Sér. in 8^{to}, Zool., 68:1-198.

1958a. Pygosteninae (Coleoptera Polyphaga) Fam. Staphylinidae. Explor. Parc Nat. de l'Upemba, Mission G. F. de Witte et al., 1946-1949, Fasc. 49 (4): 33-40.

1958b. Revision of the Pygosteninae (Coleoptera Polyphaga) Fam. Staphylinidae. Explor. Parc Nat. Albert, Mission G. F. de Witte, 1933-1935, Fasc. 91 (1): 3-11.

RAIGNIER, A. AND J. VAN BOVEN

1955. Etude taxonomique, biologique, et biométrique des *Dorylus* du sous-genre *Anomma* (Hymenoptera Formicidae). Ann. Mus. Royal Congo Belge Tervuren, n.s. in 4^{to}, Zool., 2:1-359.

A NEW GENUS AND SPECIES OF MAYFLY FROM PERU (Ephemeroptera: Leptophlebiidae)

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Among the specimens of mayflies collected by Drs. E. S. Ross and E. I. Schlinger during the California Academy of Science expedition to Peru are male imagoes of a remarkable new genus and species of the mayfly family Leptophlebiidae. The males, the only stage known, are immediately recognizable on the basis of the remarkable turbinate upper part of the eyes.

Genus *Miroculis* Edmunds, new genus

(Figs. 1-5)

Small mayflies with forewings four to five mm long. Eyes of the male divided, the upper portion stalked, with large ommatidia (fig. 4), the upper portion of the eyes separated from one another by a distance equal to their diameter. Forelegs of male nearly as long as forewings; the length of various segments in relation to the femur are as follows, tibia 1.53, tarsus one .045, tarsus two and three .6, tarsus four .3, and tarsus five .15. Tarsus five of forelegs expanded apically. Claws dissimilar, one claw truncate, the other with a digitate hook. (Middle and hind legs broken from the specimens.) Wings and venation as in figures 1 to 3. Costal angulation of hind wing acute.

Type species: *Miroculis rossi* described below.

Miroculis rossi Edmunds, new species

Head dark brown, the upper half paler; antennae with scape and pedicel smoky, the flagellum pale yellowish brown; lower portion of eyes grey; the sides of the turbinate portion light brown at base, paler above; the facets of the turbinate portion light yellow brown, separated by dark brown grooves.

Thorax dark brown, with darker smoky brown markings at margins of pronotum, along the mesonotum next to the outer parapsidal furrows and on the pleura at leg bases; the scutellum darker brown, forewings with

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